

$\frac{1}{\sqrt{2}} \begin{pmatrix} 1 & i \\ 0 & 1 \end{pmatrix}$

**TITLE: INTELLECTUAL PROPERTY MANAGEMENT
METHOD AND APPARATUS**

INTERNATIONAL BUSINESS MACHINES CORPORATION

Express Mail Label: EL046034495US

INTELLECTUAL PROPERTY MANAGEMENT
METHOD AND APPARATUS

Technical Field

5 The present invention relates to intellectual property,
and more particularly, to a method, apparatus and computer
program product for proactively creating, developing and
managing an intellectual property portfolio.

Background of the Invention

10 The term "intellectual property" refers to patents,
trademarks, service marks, copyrights and proprietary
technology such as trade secrets or know-how. Intellectual
property is a special classification of intangible property,
and is unique because the owner of intellectual property is
protected by law from unauthorized exploitation of it by
15 others. Computer software is considered intellectual
property because it can be subject to patent, trade secret
or copyright protection.

20 Intellectual property is a central resource for
creating and maintaining commercial power. Creating,
developing and managing of strategic intellectual property
to ensure future licensing revenue has become an important
goal in almost all industries.

Current intellectual property portfolios are most often developed tactically as the result of solving day-to-day technical problems associated with manufacturing, development, etc. The problem with this approach, however, is that portfolios are inherently the result of a reactive managing of resources; for example, in view of the day-to-day technical problems solved by inventors within the company.

Summary of the Invention

10 In order to build a premier intellectual property portfolio, techniques for targeting strategic (e.g., products, standards, etc.) patent or other intellectual property development opportunities are believed desirable, as well as techniques for measuring invention development progress. This invention addresses these goals by providing proactive intellectual property development and measurement methods, apparatus and computer program products.

Briefly summarized, presented herein in one aspect is a method of managing resource allocations within an intellectual property portfolio. The method includes: determining available resource capacity for an intellectual property activity in a tracking system; assigning technical attributes to the activity in the tracking system; apportioning resource capacity for the activity by technical attribute based on a value assigned to each of the technical attributes and based on available resource capacity; obtaining actual resource usage by technical attribute from the tracking system; and managing resource allocation for

the intellectual property activity by determining the difference between the actual resource usage and the resource allocation by technical attribute.

In another aspect, a method of managing invention disclosures is presented. This method includes: determining a desired number of invention disclosures based on available resources; apportioning the desired number of invention disclosures by a plurality of technical attributes based on a value assigned to each of the technical attributes; tracking an actual number of invention disclosures by technical attribute and comparing the actual number of invention disclosures with the desired number of invention disclosures; and responsive to the comparing, proactively managing at least one of invention disclosure creation and invention disclosure evaluation for patent searching or patent application filing.

In a further aspect, a data structure is presented for facilitating managing of resource allocations within an intellectual property portfolio. The data structure has a first field and a second field. The first field includes actual resource usage for an intellectual property activity by technical attributes over a first time period, while the second field includes actual resource usage for the intellectual property activity by technical attributes over a second time period, with the second time period being longer than the first time period. Comparison of information within the first field and the second field facilitates managing resource allocations for the

intellectual property activity within the intellectual property portfolio.

Apparatus and computer program products corresponding to the above-summarized methods are also described and
5 claimed herein.

To restate, areas of technology of disclosures have been analyzed historically, but not with an intent of managing future output of any subsystem such as proposed herein. In accordance with the present invention, specific
10 technical areas are monitored in concert with an overall resource capacity on both a short term and long term basis. The invention is particularly beneficial across a distributed organization. Advantageously, the concepts disclosed herein provide an ability to actually manage the
15 number of intellectual property items owned, pending or retained in a portfolio in a particular area of technology. This can be significant in any industry or to any organization which deals in many areas of technology. Another advantage of the present invention is an ability to
20 extend the managing cycle to the life of an IP item, for example, from disclosure evaluation to issuing of patents, to even their maintenance. Thus, presented herein is an intellectual property management process which provides an ability: to optimize an intellectual property portfolio for
25 a value based on current activity within the portfolio; to control cost effectively by screening less desirable technologies more closely; to control cost effectively by having detailed information available about the status of

the portfolio and invention activity; and to invigorate invention where needed based on monitored input data.

Additional features and advantages are realized through the techniques of the present invention. Other embodiments and aspects of the invention are described in detail herein
5 and are considered a part of the claimed invention.

Brief Description of the Drawings

The above-described objects, advantages and features of the present invention, as well as others, will be more
10 readily understood from the following detailed description of certain preferred embodiments of the invention, when considered in conjunction with the accompanying drawings in which:

15 FIG. 1 is a process diagram of one embodiment of an intellectual property management facility in accordance with the principles of the present invention;

FIG. 2 is a more detailed process diagram of an alternate embodiment of an intellectual property management
20 facility in accordance with the principles of the present invention, wherein invention disclosures are proactively managed and evaluated;

FIGS. 3A and 3B are a diagram of one embodiment of an intellectual property management report which can be
25 generated in accordance with the principles of the present invention; and

FIG. 4 depicts one example of an overview computing system which can be used to implement an intellectual property management facility in accordance with the principles of the present invention.

5

Best Mode for Carrying out the Invention

FIG. 1 is an overview of one embodiment of an intellectual property (IP) management facility, generally denoted 10, pursuant to the present invention. The facility includes determining an available intellectual property resource 12. "Determining an available resource" can be defined as assessing the money, time units or other constraining measure(s) to be managed. In parallel with this, technical attributes are defined and/or categories of IP interest are established 14. "Defining technical attributes" (herein also referred to as "tags") means breaking down any given technology into at least two groups which need to be managed separately. If desired, a business can be broken down into very specific tags as described further below. These tags can then be grouped into major "areas" to be periodically reported on. Ideally, the tags will cover all areas of interest of a given business.

The available intellectual property resources and the defined technical attributes are inputs used to apportion resource capacity for each technology attribute or category 16. "Apportioning the resource capacity" is the budgeting process of determining how various items are to be divided within an "ideal" management process. For example, each major area is allocated a percentage of the total resource

available. These are the "total guidelines" for a given period of time. Note that as an alternative to defining technical attributes 14, preexisting attributes such as Patent Office class and subclassifications could be employed
5 for a given intellectual property portfolio.

The "actual usage" of an intellectual property resource for a given technical attribute is monitored 18. This information can be stored in and extracted from, for example, a patent tracking database (as described further
10 below). The monitored information may comprise numbers of documents which have been processed for whatever screening/review is being managed. In the example of FIG. 2, disclosures are tracked from submission to first evaluation. The process could be extended to managing any
15 intellectual property activity, for example, managing issuance of patents or maintenance of patents in one or multiple cycles of the basic technique.

The apportioned resource capacity for each technology attribute or category 16 and the actual indication of usage
20 of intellectual property resources by technical attribute or category 18 are employed to actively manage available resources by discerning differences between the apportioned resource capacity and the actual usage apportioning 20. In one embodiment, this proactive managing process can be
25 facilitated by printing a monthly report and reviewing the report with individuals within a business responsible for actual usage decisions, and encouraging or discouraging these individuals to provide more or less output. As a practical matter, various approaches can be employed to

effect proactive management using the facility provided herein. For example, one approach might be to establish a team of technical people to specifically create a number of new disclosures/inventions for one or more of the

5 apportioned areas of technology. That is, the technical community can be stimulated using various techniques to increase or decrease their output of ideas in a given technology area.

FIG. 2 depicts one embodiment of a technique for

10 managing invention development from creation to initial evaluation of disclosures to achieve a desired patent portfolio distribution. Initially, a strategy includes the current and future opportunity space for the business should be understood 30. This includes an analysis of factors such

15 as emerging technology requirements, current intellectual property portfolio mix, current and future licensing revenue measurements, current and future business revenue measurements, research and technology development expertise, etc. Once the portfolio analysis 30 has been completed or

20 updated, technology areas requiring intellectual property development are identified and targeted, i.e., portfolio objectives are created 40 using identified technology tags 42. Invention development guidelines per technology area are set based upon the portfolio analysis 30 information and

25 resource constraints 44. Constraints may comprise available money, time units, capacity and any other measure which would operate as a constraint on the intellectual property activity to be managed.

5 The portfolio objectives 40 and identified technology
tags 42 are used in generating a patent activity report 50.
The patent activity report details total disclosure activity
in each of the technological categories comprising the
10 portfolio, for example, relative to portfolio objectives,
including: number of disclosures evaluated, number of
disclosures selected for patent protection, number of
disclosures waiting for evaluation and disposition, and
relative success rate of disclosures over a given period of
time. FIGS. 3A and 3B depict one example of such an
activity report (described below).

15 Depending upon the type of activity report, IP creation
activity may be initiated based on status of current
disclosure activity compared to portfolio objectives 62.
One aspect of the IP creation activity may be to
intentionally generate new inventions 64 for which
disclosures may be submitted 66. To accomplish this, lead
technologists can identify and prioritize specific
opportunities requiring invention development within the
20 technology areas, and regularly communicate these
opportunities to company employees. Simultaneously and
continuously, inventors can be educated and motivated to
innovate and document their innovations. Proactive
invention development methods employing teams, composed of
25 individuals having key skills relevant to the opportunity,
may also be used to generate novel solutions. Proactive
invention development methods include opportunity
identification, brainstorming, associative thinking,
critical thinking, and idea development exercises.

Note that the GENERATE NEW INVENTIONS activity 64 of FIG. 2 is separate from the INDEPENDENTLY CREATED INVENTION DISCLOSURES activity 68, which would conventionally be documented and submitted on the inventor's own initiative.

5 Each invention disclosure is categorized by technical content or subject matter 70 by the person submitting the disclosure, for example, using the technology "tagging" system initially identified 42. The tagged invention disclosure data is analyzed regularly, through the
10 generation of periodic patent activity reports, and compared to portfolio objectives in order to increase/decrease the proactive invention development focus, set evaluation criteria, adjust guidelines, and understanding what the IP mix is, for example, at various stages in the patent
15 development process.

The received invention disclosures, which in one embodiment may be stored in the patent tracking system database, are forwarded to an evaluation process 80. Here, with a patent activity report(s) indicative of status of the
20 patent activity relative to portfolio goals the disclosures are evaluated. In one embodiment, the evaluation process may be performed by one or more evaluation teams. Each disclosure is evaluated for patentability, business and licensing value in view of the portfolio goals identified in
25 the patent activity report(s). If a particular disclosure does not meet the criteria for filing a patent application, then no action is taken and the record of the disclosure in the database 60 is updated with a rating of "Close." If sufficient interest is present to pursue patentability, a
30 "Search" rating is indicated and the invention disclosure is

forwarded for possible preparation of a patent application
90. The decision whether or not to forward a particular
invention disclosure for patenting is data that is also fed
back to the patent tracking system database 60, and is
5 employed in the next patent activity report.

FIG. 3 depicts one embodiment of a patent activity
report, herein referred to as a disclosure status report,
which tracks the number of invention disclosures submitted
for evaluation by major technology categories, and
10 organizations and/or locations. This report, or data
structure, includes separate fields which indicate the
percent of invention disclosures rated search in the last
twelve months, the percent of invention disclosures rated
search in the last three months, the number of invention
15 disclosures currently awaiting evaluation, the total number
of invention disclosures evaluated year to date, the number
of invention disclosures rated search (i.e., the number
passed to process 90) year to date, and the year to
date/total year to date objectives, again for each of the
20 major technology categories and locations. Those skilled in
the art will note that this report is merely one example of
a patent activity report which could be generated using the
concepts of the present invention. For example, subclasses
within the major categories could also be tracked
25 independently, and the twelve month period and three month
time period for the percent of invention disclosures rated
search could be adjusted. A disclosure status report such
as depicted in FIGS. 3A & 3B provides an evaluator with a
ready reference that shows all of the information needed to
30 proactively manage resources to achieve, for example, yearly

set guidelines for a given technology category and/or
company location. The DISCLOSURE STATUS REPORT shown in
FIGS. 3A and 3B shows status reporting in nine major or
Technology categories for each of four reporting locations,
5 A, B, C, and D.

By way of example, the following patent tracking system
technology tags might be employed in generating the report
of FIGS. 3A and 3B.

10 **Semiconductor Processing**
 101A Back End of the Line Technology (BEOL)
 101B Front End of the Line Technology (FEOL)
 101C Photolithography Materials & Masks
 101D Transistors, Devices or Cell Structures
15 180 Misc. Solid State Technology
 190 Misc. Non-S/C Technology
 Semiconductor Manufacturing
 110A Manufacturing Apparatus
 110B Modeling. CAD/CAM, Circuits, Processes
 Semiconductor Testing
20 110C Testing. In-Line & Final
 Circuits
 120 Semiconductor Analog & Logic Circuits
 170 Power Supplies
 Memories
25 140 Semiconductor Memories
 Interconnect Technology
 150 Circuit Interconnect/Packaging & Material
 Recovery
 Computer Architecture/Microprocessor
30 200 Central Processing Unit Organization & Control
 209 Design Patents
 210 Interfacing
 220 Storage Management
 230 Reliability/Availability/Serviceability
35 240 Multiprocessor
 250 DP Programming
 260 Network Computers
 280 IA.64 Architecture

Applications

300 Moving Storage

400 Human Interface Front of Screen Display &
User Input Systems

5 500 Displays and Printers

600 Software Related Services, Applications &
Solutions

Networking

700 Networking Centric

10 As can be seen, the nine major reporting categories in,
the status report are actually made up of one or more
specifically defined Technology Tags. These tags, in turn,
may further include additional more specific tags as
subcategories. The level to which the status report is
15 directed depends on the particular objectives established by
the then current PORTFOLIO OBJECTIVES activity 40. Should a
very specific subcategory within an existing Technology tag
warrant independent management then it can be sub-divided
into new tags which could be, on an individual basis,
20 designated as a "reporting category."

In implementing the subject invention, the preferred
embodiment utilizes two Lotus Notes (a trademark of Lotus
Development Corporation) databases designated herein as
INVENTION TRACKING SYSTEM DATABASE 60 and a PATENT
25 PROSECUTION DATABASE (not shown). Access to Lotus Notes is
available to most inventors and others involved in the
invention process throughout the corporation at their
desktops. When an inventor intends to submit an invention
for review, a draft version of the document can be stored in
30 the database. This copy can be retrieved and circulated to
other inventors or associates for review and comment. When
the inventor desires to submit the disclosure document, a

selection is made as to the specific Technology Tag under which the inventor believes the invention should be categorized.

Submitted disclosure documents are entered into the database and next processed by an Intellectual Property Law organization responsible for the particular tag selected. If the IP Law organization administrator accepts the document as appropriate, the document is given a unique disclosure number, the Technology Tag(s) is entered on the disclosure document and the document is automatically forwarded to an Invention Development Team (IDT) for evaluation.

An IDT comprises a portfolio manager responsible for the technical area to which the disclosure is directed, a patent attorney or professional, one or more technical consultants and the inventor(s). The IDT reviews the invention and, based on the advice of the team members and consistent with Portfolio Objectives, determines the rating of the disclosure. The rating is entered into the disclosure record in the database 60. Disclosures can be rated "Close" (if no further action is deemed necessary), "Publish" (if defensive protection by publication is deemed appropriate) or "Search" (if patentability is to be further investigated).

The evaluation is entered into the disclosure document with reasons, if appropriate. If the evaluation is "Search" the responsible IP Law personnel can enter a specific concept to be searched and then send the entire disclosure

document to a person who will perform a patentability search on the invention.

Periodically, statistically relevant information, such as the inventor's names, titles, Technology Tags and status of the disclosure and evaluation are "uploaded" to a DB2 (a trademark of International Business Machines Corporation) database where such statistical data can be extracted and used to generate various reports including Disclosure Status Reports, described above.

10 In addition to the disclosure database, there is also a PATENT PROSECUTION (not shown) database which contains information similar to that in the PATENT TRACKING SYSTEM DATABASE and is based on inventions for which the filing of patent applications has been chosen as well as those
15 inventions on which applications have already been filed, or patents issued throughout the world. A corresponding DB2 database is used in conjunction with the PATENT PROSECUTION database to retain statistically relevant information about patent dockets on a corporate wide basis. Those skilled in
20 the art will appreciate that extension of the method of the invention, as described, can be applied to various aspects of invention application management as previously discussed.

One example of a computing environment incorporating and using an intellectual property management facility in accordance with the present invention is depicted in FIG. 4
25 and described below.

Referring to FIG. 4, a computer environment 100 includes, for instance, a computing unit 101 having at least one central processing unit 102, a main storage 104 and one or more input/output devices 106, each of which is described below.

As is known, central processing unit 102 is the controlling center of computing unit 101 and provides the sequencing and processing facilities for instruction execution, interruption action, timing functions, initial program loading and other machine related functions. The central processing unit executes at least one operating system, which as known, is used to control the operation of the computing unit by controlling the execution of other programs, controlling communication with peripheral devices and controlling use of the computer resources.

Central processing unit 102 is coupled to main storage 104, which is directly addressable and provides for high speed processing of data by the central processing unit. Main storage may be either physically integrated with the CPU or constructed in stand alone units. The intellectual property database described herein may, in one embodiment, reside within main storage 104.

Main storage 104 is also coupled to one or more local or remote input/output devices 106. These devices include, for instance, keyboards, communications controllers, teleprocessing devices, printers, magnetic storage media (e.g., tape, disks), direct access storage devices, and sensor based equipment. Data is transferred from main

storage 104 to input/output devices 106, and from the input/output devices back to main storage.

In one example, computer environment 100 can be a single system environment, which includes an RS/6000 computer system running an AIX operating system. (RS/6000 and AIX are offered by International Business Machines Corporation). The invention is not limited to such an environment, however. The capabilities of the present invention can be incorporated and used within many types of computer environments and many types of computer systems. For instance, computer environment 100 can include a UNIX workstation running a UNIX-based operating system. Other variations are also possible and are considered a part of the claimed invention.

The present invention can be included, for example, in an article of manufacture (e.g., one or more computer program products) having, for instance, computer usable media. This media has embodied therein, for instance, computer readable program code means for providing and facilitating the capabilities of the present invention. The articles of manufacture can be included as part of the computer system or sold separately.

Additionally, at least one program storage device readable by machine, tangibly embodying at least one program of instructions executable by the machine, to perform the capabilities of the present invention, can be provided.

The flow diagrams depicted herein are provided by way of example. There may be variations to these diagrams or the steps (or operations) described herein without departing from the spirit of the invention. For instance, in certain cases, the steps may be performed in differing order, or steps may be added, deleted or modified. All of these variations are considered to comprise part of the present invention as recited in the appended claims.

While the invention has been described in detail herein in accordance with certain preferred embodiments thereof, many modifications and changes therein may be effected by those skilled in the art. Accordingly, it is intended by the appended claims to cover all such modifications and changes as fall within the true spirit and scope of the invention.